THE CERES S'COOL PROJECT

STUDENTS' CLOUD OBSERVATIONS ON-LINE

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CERES Science Team Meeting
Newport News, VA
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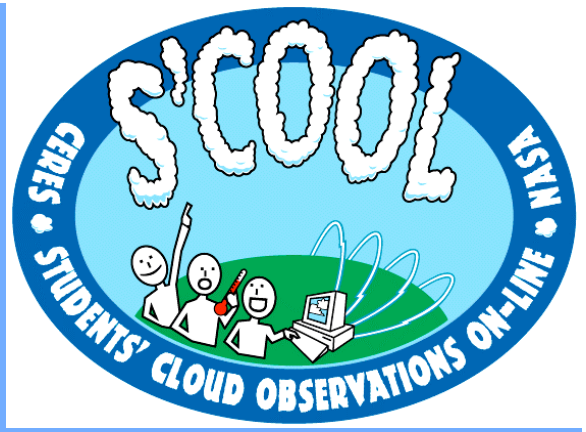
What is S'COOL?

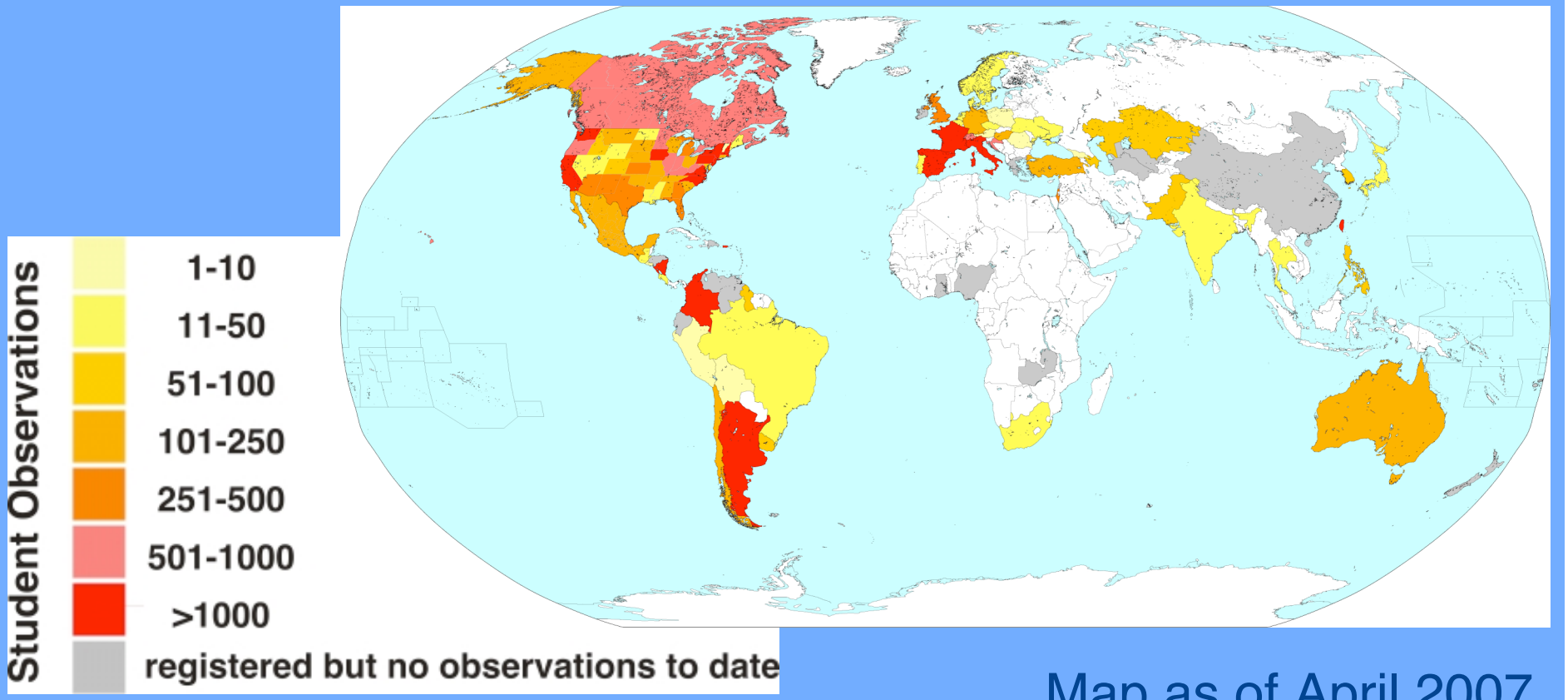


- Education and Public Outreach arm of CERES
- Backbone of Terra/Aqua formal education effort
- A simple way to involve K-12 students in authentic science
- A source of validation data for the CERES cloud retrievals

http://scool.larc.nasa.gov

S'COOL Project

- > 60,500 observations from 50 countries and all 50 states
- 41 % from outside the US (80% US participants)
- > 2,250 registered participants from 70 countries



Map as of April 2007

New Person

- Camelia Deller has joined us on a part-time basis
- Spanish speaker (from Barcelona)
- Handles contacts and inquiries from the Spanish-speaking world
- 20-25% of new registrations are from Spanish speakers since October
- 25% of observations since October are from Spanish speakers

Impact Measures

- Lots of requests for S'COOL materials since Oct. 2006 (a noticeable increase in the rate)

States "Top Five"	
▪PA	21%
▪VA ↓	9%
▪PR	6%
▪NH	5%
▪CA	5%

Small Changes

Countries "Top Five"		
▪US	59%	
▪Colombia	8%	
▪France	7%	↓
▪Argentina	6%	
▪Taiwan	4%	↑

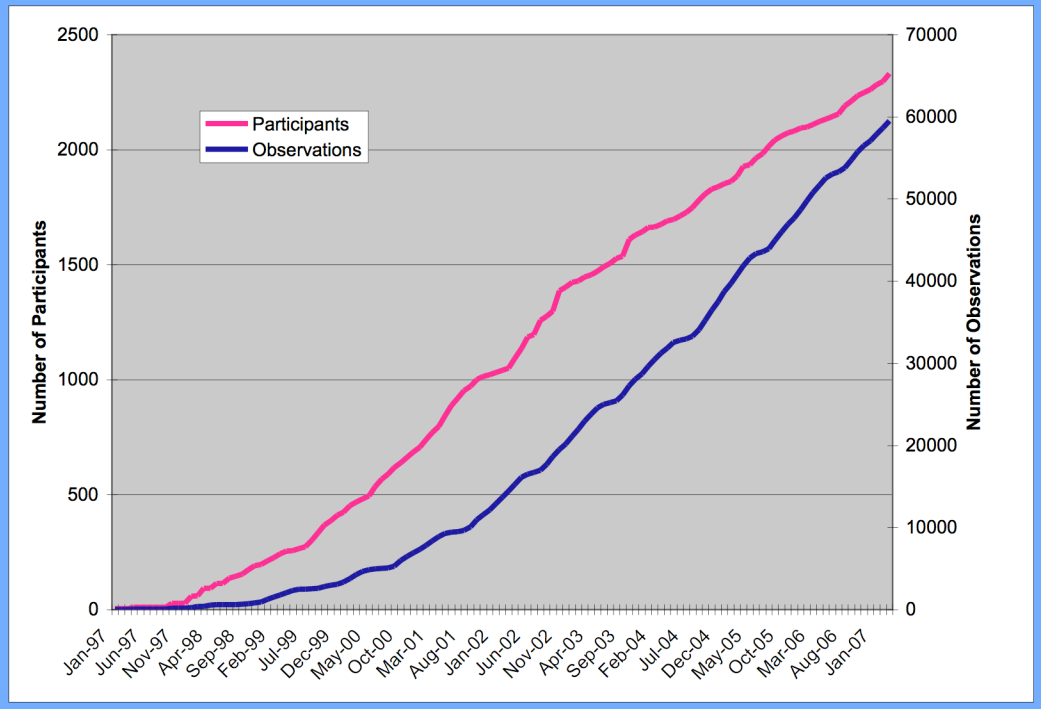
Still No Change

States "Bottom Five"	
▪Virgin Islands	9
▪Vermont	7
▪Guam	6
▪Delaware	3
▪Northern Marianas	0

Impact Measures (cont'd)

Database of observations - as of Oct. 2006

- > 25,000 satellite correspondences
  - For 42% of ground observations
- 2,254 registered participants
  - 39% submitted data
- 70 countries
  - data from 50 countries (71%)



S'COOL Data

asd-www.larc.nasa.gov/SCOOL/usedata.html

Latitude	Longitude	City	State	Country
42.82	-72.03	Jaffrey	NH	USA

Ground Observation - 63085			
Date: 2007-04-11		Local Time: 13:56:00	Universal Time: 17:56:00
Opacity	**Cloud Cover**	**Type**	**Visualization**
Transparent	Clear (0% to 5%)	Cirrus	
Persistent Contrails: 00		Short-Lived Contrails: 00	
Surface Observations:	Snow/Ice: Yes Standing Water: No Muddy: No Dry Ground: Yes Leaves on Trees: No		
Temperature: 9.00 C Barometric Pressure: 985.30 hPa Relative Humidity: 34.00			
Comments: About 50/50 snow and bare ground			

1 degree

Cloud Cover
Partly Cloudy (5% to 50%) 7.84
Partly Cloudy (5% to 50%) 39.48
Partly Cloudy (5% to 50%) 23.66

subset

Cloud Cover
Clear (0% to 5%) 0.43
Partly Cloudy (5% to 50%) 7.82
Partly Cloudy (5% to 50%) 6.89

Old Match:
Clouds processing

New Match:
subset from SSF

Phase	Temp(K)
ice	244.00
ice	252.25
mixed	274.38

0.55

6.89

Persistent Contrails: 00 | Short-Lived Contrails: 00

Surface Observations: Snow/Ice: Yes; Standing Water: No; Muddy: No; Dry Ground: Yes; Leaves on Trees: No

Temperature: 9.00 C
Barometric Pressure: 985.30 hPa
Relative Humidity: 34.00

Comments: About 50/50 snow and bare ground

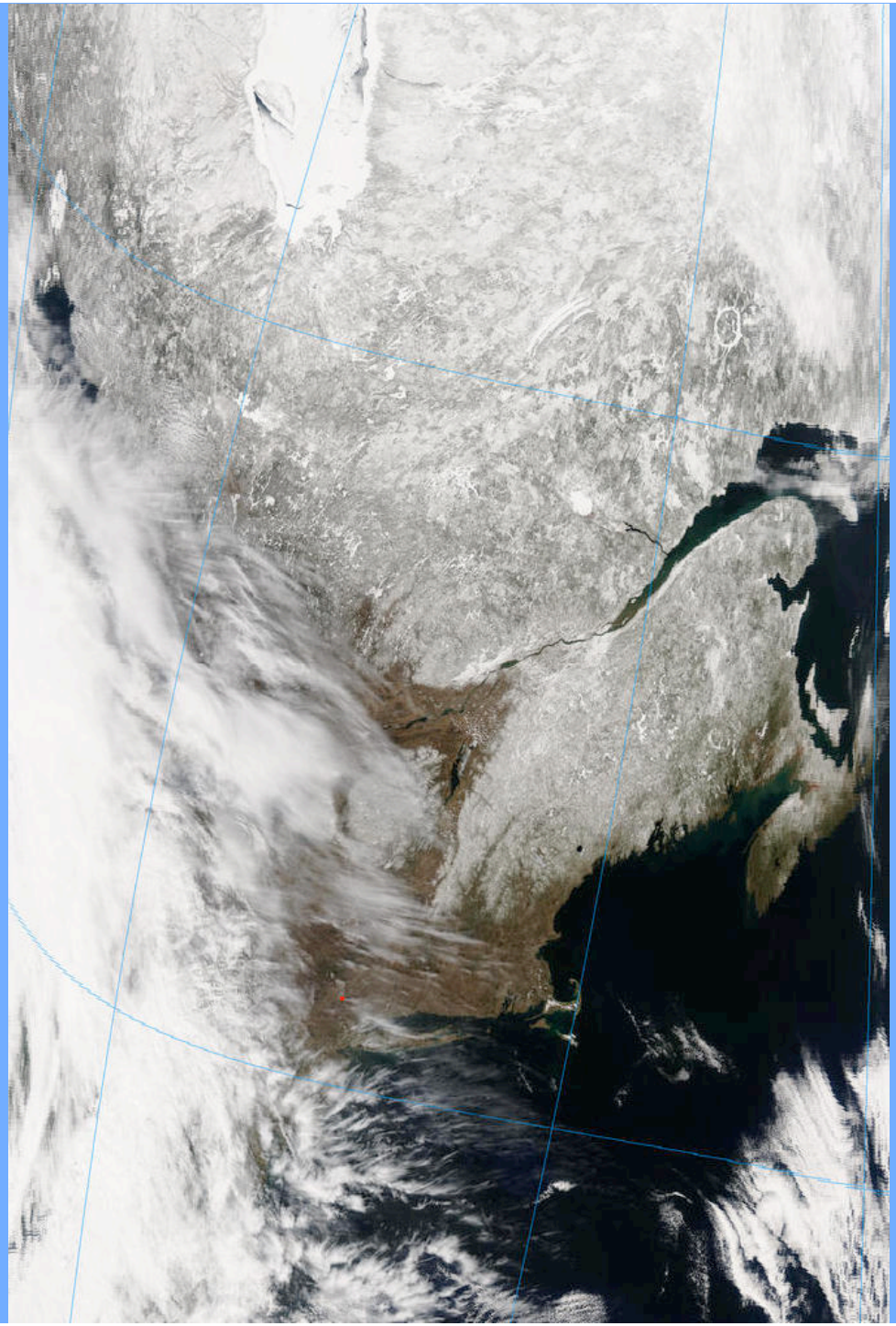
View Corresponding MODIS Satellite Image

S'COOL Data

Issue of interest:
Snow-covered ground

Many intriguing reports recently from:

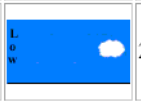
- Alaska
- New Hampshire
- New York



S'COOL Data (Cont'd)

- 479 observations have both Terra and Aqua satellite match
- Under the current auto-email system, these are being shared immediately with the CERES clouds group.
  - Also can be explored on-line: http://scool.larc.nasa.gov/en_query_double_matches.html

Latitude	Longitude	City	State	Country
59.97	-154.85	Nondalton	AK	USA

Ground Observation: 62924				Aqua: 1165318					Terra: 1165809				
Date: 2007-04-05		Local Time: 13:57	Universal Time: 21:57	Date: 2007-04-05		Universal Time: 21:57:00			Date: 2007-04-05		Universal Time: 21:44:00		
Opacity	Cloud Cover	Type	Visualization		Altitude	Opacity	Cloud Cover	Phase Temp (C)		Altitude	Opacity	Cloud Cover	Phase Temp (C)
					9.26	Transparent 2.41	(5% to 50%) 49.80	ice 219.54		9.04	Translucent 4.16	(0% to 5%) 3.00	ice 221.07
					7.20	Opaque 23.36	(50% to 95%) 50.20	ice 234.84		6.75	Opaque 23.28	(95% to 100%) 96.55	ice 237.55
Opaque	(95% to 100%)	Stratocumulus								2.34	Opaque 22.73	(0% to 5%) 0.45	ice 258.50
													
Persistent Contrails: 00		Short-Lived Contrails: 00											
Surface Observations:	Snow/Ice: Yes Standing Water: No Muddy: No Dry Ground: Yes Leaves on Trees: No												
Temperature: 6.67 C Barometric Pressure: 985.66 hPa Relative Humidity: 57.00 %													
Comments: No comments provided by participant.													

(Aqua and Terra do not always match)

S'COOL Interaction (1)

- Have sent 3,533 FLASHFlux auto-emails since we began this in mid-September 2006
- 1,730 observations have been classified by participants
- 495 comments provided back to S'COOL by email
- Responded to a large fraction
- Developing Comparison FAQ with common themes

Please help to classify how your ground observation compares to the Aqua satellite's observation. Select one of the below categories to describe how well the two match.

Class Number	Name	Description	Developed By
1	○ Perfect match with Aqua	Cloud cover and opacity match perfectly at all 3 levels	S'COOL Team
2	○ Cloud cover match	Cloud cover matches at all three levels	S'COOL Team
3	○ Overcast or mostly cloudy low	Overcast or mostly cloudy low cloud corresponds to satellite; other levels not observable from the ground	S'COOL Team
4	○ Overcast high or mid	Overcast high or mid-level cloud; other levels not observable from satellite	S'COOL Team
5	○ Fuzzy match	Cloud cover differs by at most one category at all levels	S'COOL Team
6	○ Sparse cloud	Ground or satellite reports 0-5% cloud only at a single level; the other sees nothing	S'COOL Team
99	◉ None of the above	I cannot put this correspondence in any of the above categories.	S'COOL Team

Please comment on the quality of the match: Might there by anything about the ground observations or the Aqua satellite data that would explain any disagreement between the two?	The only thing we can think of that may account for the discrepancy is there were more clouds near the horizon (to the south and southeast) which may have been low to mid- level. Overhead was pretty clear. Based on information in the introductory packet from S'COOL we didn't report the distant clouds thinking they were out of range of the satellite viewing area. Maybe they were closer than we thought.

S'COOL Interaction (2)

- Email on new subset/footprint matching starts THIS WEEK
- Includes link to BOTH matching methods, when available

Date: Thu, 19 Apr 2007 12:46:46 -0400

Hello Jaffrey Grade School students,

ATTENTION : This is the **new** satellite matching process we mentioned in our March enote that compares your ground observation to a smaller piece of the satellite data. We call this smaller piece of the satellite data a "footprint" where your school is in the center of the satellite "footprint".

The link(s) below will display one or more of your S'COOL observation reports that has been matched using this new method. We are interested in your comments on how this satellite information compares to your ground observations. In particular we would like to know whether the agreement is better or worse than the regular method that we have been using.

Footprint April 11, 2007 Regular April 11, 2007

When you have time, please look at the information for these dates in comparison to your report form and to the standard satellite match if you received one. Do you have any comments on this comparison? Do you remember anything about the conditions on this day which would help to explain the comparison? Do you notice anything interesting or odd about the two different satellite methods? You may wish to refer to the Frequently Asked Quetions page.

Thank you for your S'COOL cloud observation report! As always, we welcome your comments and feedback.

S'COOL Presentations
Since October 2006

- Presentations at local science teachers conference
- Presentations at regional and national Science Teachers Association Conference (NSTA)
- Teacher Workshop at Virginia Air and Space Center
- Presentation at NASA HQ

S'COOL + SPHERE

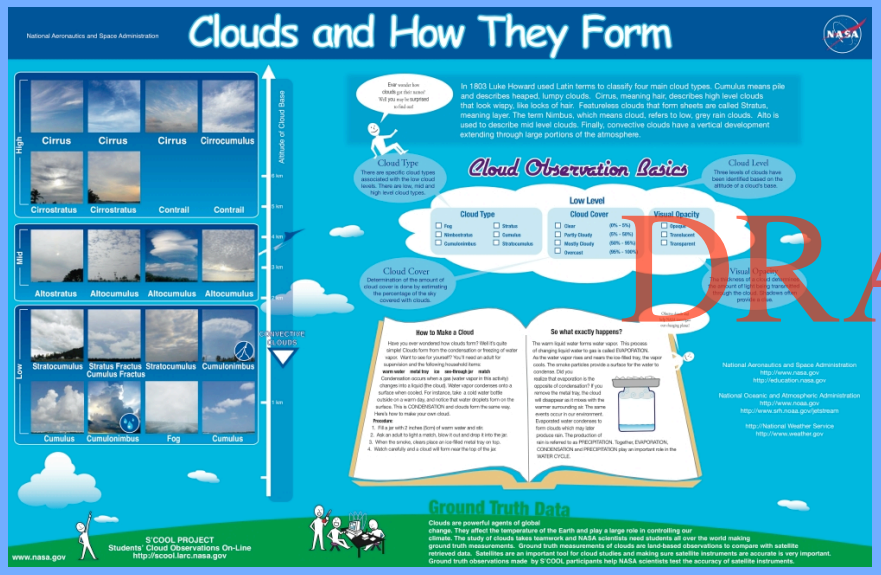
- Will have 2-3 college students for 8 weeks this summer
- Hoping to continue analysis of ground vs satellite data
- Suggestions welcome!

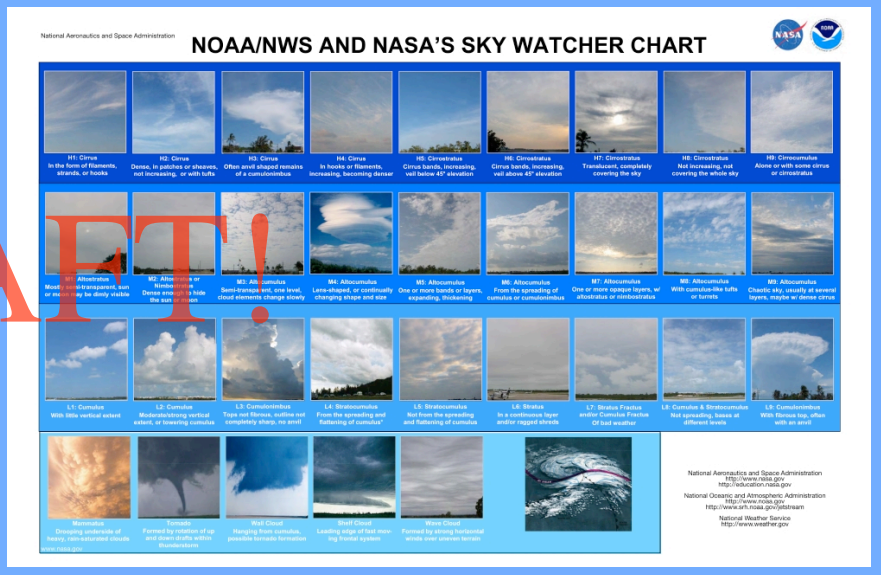
S'COOL in the Field

- Teacher Ambassador presentations:
  - Massachusetts Environmental Education Society (T. Kisiel)
  - NSTA Baltimore (F. Brezna and K. Waljeski-Moses)
  - State Weather Workshop, New Hampshire (N. Munsey)
  - SEEC Conference in Houston Texas (L. Werhun)
  - Science and Math teachers convention - Saskatoon, Canada (C. Dauvin)
  - Minnesota Science Teachers Association and teacher training through MnSTEP. (J. Minerich)

S'COOL Connections

- Contacted by NOAA/NWS about creating a joint cloud chart
- NOAA would print and distribute > 100,000 copies





S'COOL Needs YOU!

- **Participants in every state and 70 countries**
  - Offer to serve as a **resource to a local teacher**
  - Arrange a **S'COOL visit when traveling**
  - Provide **S'COOL info to teachers you know**
- **Presentation materials available**, with script suggestions
- **Help with translation of materials**
- **Serve as resource for scientific content questions sent in by participants**